REMARKS

Introduction

Applicants respectfully request that the above-identified patent application be reexamined and reconsidered. Claims 1-36 are now pending in this application. In a non-final Office Action dated January 28, 2003 (hereinafter "Office Action"), Claims 1, 3-5, and 6-9 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,999,185 to Kato et al. (hereinafter "Kato"). Claims 2, 19, 20, 22-24, and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kato in view of U.S. Patent No. 6,091,410 to Lection et al. (hereinafter "Lection"). In addition, Claims 10-18, 32, and 34-36 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Kato in view of U.S. Patent No. 5,999,185 to Robertson et al. (hereinafter "Robertson").

In this response to the Office Action, applicants have amended the claims to more particularly point out and define the subject matter that applicants regard as the invention. Applicants submit that the subject matter of the amendments provided herein does not introduce new matter, as this subject matter is disclosed in applicants' specification on pages 33-35. Applicants hereby cancel Claims 24-31 without prejudice. Pursuant to 37 C.F.R. § 1.111, and for the reasons set forth below, applicants respectfully request reconsideration and allowance of this application.

Rejection Under 35 U.S.C. § 102

With regard to Claim 1, as amended, applicants claim a method for providing a virtual environment for simulating the arrangement of a plurality of parts into an assembly. The method defines a combination of steps including the steps of:

> creating a model in a design environment for each part, each model having a geometry that corresponds to a part;

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translating each model into a virtual part in the virtual environment, the design environment being integrated with the virtual environment;

obtaining data representing one or more physical properties, including mass properties, of at least one virtual part;

determining a variable representative of a force associated with at least one virtual part, wherein the variable representative of the force is calculated by the use of the data representing one or more physical properties;

enabling each virtual part to be positioned in an assembly within the virtual environment, wherein the positioning of each virtual part enables a motion simulation to be performed for the arrangement of the plurality of parts into the assembly; and

controlling the motion simulation by limiting the movement of at least one virtual part if the variable representative of a force is greater than a predetermined value.

As defined in Claim 1, applicants specifically define a method that obtains data representing mass properties of at least one virtual part, and uses the mass properties to calculate a variable representative of a force associated with the virtual part. As described on pages 32-35 of applicants' specification, the present invention utilizes this claimed method to implement a physical based model that can simulate physical constraints without using computationally expensive collision detection. *Applicants' Specification*, page 33, lines 1-5.

Conversely, Kato's disclosure is limited to a system having displayed objects that may be moved within a virtual reality space. In addition, as described on Col. 18, lines 25-40, of Kato, the system utilizes position data to restrict the movement of the objects if there is a collision. *Kato*, Col. 18, lines 25-40. This feature is illustrated in Kato's example utilizing the data describing the height of the table. In this example, the data describing the height of the table restricts the movement of the object if there is a collision. *Id.*

Kato fails to disclose or suggest a method that obtains "data representing one or more physical properties, including mass properties, of at least one virtual part." In addition, Kato

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does not suggest a method or system that determines "a variable representative of a force associated with at least one virtual part, wherein the variable representative of the force is calculated by the use of the data representing one or more physical properties." In addition, Kato does not even contemplate the problems or solutions associated with applicants claimed virtual reality system that is based on a physical model.

To establish a proper rejection under 35 U.S.C. § 102(e), "a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." M.P.E.P. § 2131 (August 2001). Section 2131 of the M.P.E.P. further states that, "the *identical invention must be shown in as complete detail* as is contained in the . . . claim." *See Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989) (emphasis added). As described above, applicants respectfully submit that a rejection under 35 U.S.C. § 102(e) cannot be appropriately applied to Claim 1 because the cited reference does not disclose each element. For at least the reasons stated above, applicants respectfully request that this rejection be withdrawn.

Since Claims 3-5 and 6-9 depend from Claim 1, the analysis applied to Claim 1 also applies to these claims. Therefore, applicants respectfully submit that Claims 3-5 and 6-9 are in condition for allowance for the same reasons as Claim 1. Further, applicants submit that the dependent claims are patentable for additional reasons. For instance, with respect to Claim 9, applicants respectfully submit that Kato fails to disclose or suggest a method of "translating a geometry information set of the plurality of parts from a parametric computer aided system to the virtual environment." Specifically, the system disclosed in Kato fails to disclose or suggest two components: a "parametric computer aided system" in combination with a "virtual environment." Moreover, Kato fails to suggest two systems that are used for "translating a geometry information set of the plurality of parts."

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Rejection Under 35 U.S.C. § 103: Kato and Lection

With regard to Claims 2, 19, 20, and 22-23, applicants respectfully submit that these claims, as amended, are patentable over Kato and Lection. Similar to the remarks noted above, applicants submit that Kato, alone or in combination with any other reference, fails to teach or suggest the claimed combination of Claims 2 and 19, which includes the steps of "obtaining data representing one or more physical properties, including mass properties, of at least one virtual part; determining a variable representative of a force associated with at least one virtual part, wherein the variable representative of the force is calculated by the use of the data representing one or more physical properties. . . ." Applicants also submit that Kato and Lection fail to suggest a method or system that is analogous to applicants' method where a "variable representative of a force" is generated by the use of a physical property of on object. Thus, for at least these reasons, applicants respectfully request that Claims 2, 19, 20, and 22-23 are in condition for allowance.

Rejection Under 35 U.S.C. § 103: Kato, Lection, and Zimmerman

By virtue of its dependency from Claim 19, applicants also submit that Claim 21 is in condition for allowance. Applicants have reviewed Kato, Lection, and Zimmerman, and are unable to find where the references suggest a method that is remotely related to a virtual environment for simulating the arrangement of a plurality of parts, where "data representing mass properties" is obtained and used for "determining a variable representative of a force associated with at least one virtual part." Thus, applicants respectfully submit that Claim 21 is in condition for allowance.

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Rejection Under 35 U.S.C. § 103: Kato and Robertson

With regard to Claims 10-18, applicants respectfully submit that these claims, as amended, are patentable over Kato and Robertson. As amended, Claims 10-18 now depend from Claim 1 and, thus, include the steps of "obtaining data representing one or more physical properties, including mass properties, of at least one virtual part; determining a variable representative of a force associated with at least one virtual part, wherein the variable representative of the force is calculated by the use of the data representing one or more physical properties. . . ." Applicants submit that Kato and Robertson, alone or in combination, fail to teach or suggest these claim elements. Thus, for at least these reasons, applicants respectfully submit that Claims 10 and 11 are in condition for allowance.

With regard to Claims 32-36, applicants respectfully submit that these claims, as amended, are also patentable over Kato and Robertson. Similar to the remarks noted above, applicants submit that Kato, alone or in combination with any other reference, fails to teach or suggest applicants' claimed method that determines a "variable representative of a force," which is generated by the use of an obtained physical property of on object. Moreover, Applicants submit that Kato, Robertson, or any other cited reference fails to suggest a method where the "force is calculated by a product of the data representing the mass properties and a *data value representative of an angular acceleration of at least one virtual part*. . . ." Applicants submit that, for at least these reasons, Claims 32-36 are in condition for allowance.

To establish a *prima facie* case of obviousness, M.P.E.P. § 2143 requires that the prior art references "must teach or suggest all the claim limitations" and that there "must be some suggestion or motivation, either in the references themselves or in knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." *See* M.P.E.P. § 2143 (August 2001). As indicated above, the Office Action has failed to show, and

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applicants are unable to find, where Kato, alone or in combination with any other cited reference, discloses or suggests each and every element of Claims 2, 10-19, 20-23, 24-26, and 32-36. Therefore, applicants respectfully submit that the Office Action has not established a *prima facie* case of obviousness and request that the rejection under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

In view of the foregoing remarks, it is submitted that the present application is now in condition for allowance. Reconsideration and reexamination of the application and allowance of the claims are solicited. If the Examiner has any questions or comments concerning this matter, the Examiner is invited to contact applicants' undersigned attorney at the number below.

Respectfully submitted,

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I hereby certify that this correspondence is being deposited with the U.S. Postal Service in a sealed envelope as first class mail with postage thereon fully prepaid and addressed to Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on the below date.

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